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EXAMINER

ZERVIGON, RUDY

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 08/26/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application N .

09/470,446

Applicant(s)

INGLE ET AL.

Examiner

Rudy Zervigon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 June 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 and 8-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 29, 2003 has been entered.

### ***Claim Rejections - 35 USC § 102***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 6, 9, 11, 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawakami Soichiro (JP61-37969)<sup>1</sup>. Kawakami Soichiro describes:

- i. 1. A gas delivery metering tube (item 23, Figure 3 - Figures 1,2) for delivering a gas (Purpose, first line), comprising:
- ii. an elongated innermost tube (item 3, Fig.1,2) attached to a gas supply (5, Figure 1, page 6, last paragraph of translation) at one end and capped at the other – Figure 1 shows the innermost tube (3) as “capped” at the extreme end opposing the gas supply, as claimed by claim 1

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- iii. at least one outermost (items 2,1, Fig.1,2) tube, both the inner and outermost axially aligned tubes, elongated, nested tubes having an effective annular space (items 18-20, Figures 1,2; “buffers”, Constitution) formed between the at least one innermost (item 3, Fig.1,2) and outermost (items 2,1, Fig.1,2) nested tubes, as claimed by claim 1
- iv. one or more arrays of orifices (items 13, 14, 15; Fig. 1,2) formed in each of the at least innermost (item 3, Fig.1,2) and outermost (items 2,1, Fig.1,2) nested tubes and extending along the substantial length (Figures 1,2) of each of the tubes
- v. an outermost elongated tube (items 2,1, Fig.1,2), the outermost tube having two ends, one or more arrays (13, 14; Fig.1,2) of orifices being formed in the outermost tube (items 2,1, Fig.1,2) and extending along the substantial length of the outermost tube, the outermost tube being disposed such that it is axially aligned with the innermost tube (Fig. 1,2), and such that an effective annular space (item 18 or 19, Figures 1,2; “buffers”, Constitution) is formed between the at least one innermost (3) and the outermost (2 or 1) nested tubes
- vi. wherein the one or more arrays of orifices formed in said innermost tube establishes a substantially uniform (“stably and uniformly”, Constitution) backing pressure along substantially the length of the innermost (item 3, Fig.1,2) tube, thereby promoting substantially uniform (“stably and uniformly”, Constitution) delivery of the gas (Purpose, first line) out of the orifices (items 13, 14, 15; Fig. 1,2) in the outermost (items 2,1, Fig.1,2) tube and along substantially the length of the outermost (items 2,1, Fig.1,2) tube, as claimed by claim 1

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- vii. 6. The gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 wherein the metering tube (item 23, Figure 3 - Figures 1,2) is used in a chemical vapor deposition system.
- viii. 9. The gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 wherein the nested tubes are cylindrical.
- ix. 11. In combination, the gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 and at least one injector assembly (item 4, Figure 1, item 6a, Fig.4) having at least one port (item 8, Figure 1, item 3a, Fig.4) for receiving the gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2).
- x. 12. In combination, the gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 and at least one shield (item 21, Figure 3) assembly having at least one plenum (inside portion of item 21, Figure 3) for receiving the gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2).

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***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 2-5, 8, 10, and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami Soichiro (JP61-37969)<sup>2</sup>, as applied to claims 1, 6, 9, 11, 12 above. Kawakami Soichiro does not describe:

- xi. 2. The gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 wherein the effective annular space (items 18-20, Figures 1,2; “buffers”, Constitution) has an effective diameter  $D_{eff}$  and the innermost (item 3, Fig.1,2) tube has an inner diameter  $D_{in}$ , and  $D_{eff}$  and  $D_{in}$  are within a factor of three of each other.
- xii. 3. The gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 2 wherein  $D_{eff}$  is approximately equal to  $D_{in}$ .
- xiii. 4. The gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 wherein a ratio of the surface area of the outermost (items 2,1, Fig.1,2) tube to the total cross sectional area of the orifices (items 13, 14, 15; Fig. 1,2) formed in the outermost (items 2,1, Fig.1,2) tube is equal to or greater than approximately 10.

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- xiv. 5. The gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 4 wherein the ratio is greater than 100.
- xv. 8. The gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 wherein the innermost (item 3, Fig.1,2) tube has a length and a diameter and the ratio of the length to the diameter is in the range of approximately less than 70.
- xvi. 10. The gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 wherein the nested tubes are rectangular.
- xvii. 13. The gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 wherein the innermost (item 3, Fig.1,2) tube has the following properties:

$$L/D < 70$$

$$D/d \simeq > 10$$

$$N a_{\text{port}} / A_{\text{tube}} \simeq < 1$$

where L is the length and D is the diameter of the innermost (item 3, Fig.1,2) tube, d is the diameter of one orifice in the array of orifices (items 13, 14, 15; Fig. 1,2) in the innermost (item 3, Fig.1,2) tube, N is the number of orifices (items 13, 14, 15; Fig. 1,2) in the innermost (item 3, Fig.1,2) tube,  $A_{\text{port}}$  is the cross sectional area of each of the orifices (items 13, 14, 15; Fig. 1,2), and  $A_{\text{tube}}$  is the area of the innermost (item 3, Fig.1,2) tube; and the outermost (items 2,1, Fig.1,2) tube has the following properties:

$D_{\text{eff}}$  and  $D_{\text{in}}$  are within a factor of three of each other

$$\text{SurfaceArea}_{\text{outer}} / N A_{\text{outer}} \simeq 10 \text{ or more}$$

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where  $D_{\text{eff}}$  is the effective annular space (items 18-20, Figures 1,2; “buffers”, Constitution),  $\text{SurfaceArea}_{\text{outer}}$  is the surface area of the outermost (items 2,1, Fig.1,2) tube and  $\text{NA}_{\text{outer}}$  is the total cross sectional area of all of the orifices (items 13, 14, 15; Fig. 1,2) in the outermost (items 2,1, Fig.1,2) tube.

- xviii. 14. The gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 13 wherein  $D_{\text{eff}}$  is approximately equal to  $D_{\text{in}}$ .
- xix. 15. In combination, the gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 13 and at least one injector assembly (item 4, Figure 1, item 6a, Fig.4) having at least one port (item 8, Figure 1, item 3a, Fig.4) for receiving the gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2).
- xx. 16. In combination, the gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 13 and at least one shield (item 21, Figure 3) assembly having at least one plenum (inside portion of item 21, Figure 3) for receiving the gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary either the dimensions (L,D) of the gas delivery metering tube or vary the distribution ( $\text{Na}_{\text{port}}$ ) and/or the dimension ( $d, A_{\text{port/tube}}$ ) of the orifice and/or tube dimensions.

Motivation for varying either the dimensions (L,D) of the gas delivery metering tube or varying the distribution ( $\text{Na}_{\text{port}}$ ) and/or the dimension ( $d, A_{\text{port/tube}}$ ) of the orifice and/or tube dimensions is



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drawn from the level of ordinary skill in the art to accomplish the stated “Constitution” - “..the reaction gas is supplied stably and uniformly into the anode from a port 13 of the peripheral wall of the cathode 1.” and “To supply stably a reaction gas and to form a uniform thin film by providing plural chambers...” (“Abstract”). Further, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art.(Gardner v. TEC Systems, Inc. , 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied , 469 U.S. 830, 225 USPQ 232 (1984); In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04)

### ***Response to Arguments***

6. Applicant's arguments filed May 29, 2003 have been fully considered but they are not persuasive.

7. Applicant states, with reference to Soichiro, that “pipe 5 is the sole source of gas into the cathode assembly taught by Soichiro and that none of the other nested partitions are attached to a gas supply at one end. Pipe 5, and only pipe 5 in the Soichiro apparatus is connected to the gas supply.”, as such, Applicant implies that Soichiro does not teach that all “of the other nested partitions are attached to a gas supply at one end” because “only pipe 5 in the Soichiro apparatus is connected to the gas supply.”. This further implies that Applicant is somewhere claiming “all of the other nested partitions are attached to a gas supply at one end” in Applicant’s invention. However no where in Applicant’s claims does Applicant specifically require that all of the

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Applicant's partitions "are attached to a gas supply at one end". Applicant only requires, according to claim 1, that "said innermost tube being attached to a gas supply at one end and capped at the other". Soichiro teaches said limitation claimed as stated above. As a result:

8. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. (See MPEP § 2145, § 2111 - § 2116.01; *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993); *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571-72, 7 USPQ2d 1057, 1064-1065 (Fed. Cir.), cert. denied, 488 U.S. 892 (1988); *Ex parte McCullough*, 7 USPQ2d 1889, 1891 (Bd. Pat. App. & Inter. 1987).

9. Applicant states that Soichiro's innermost tube is tube 5. However, Applicant claims in claim 1 - "an elongated innermost tube attached to a gas supply at one end and capped at the other...one or more arrays of orifices formed in each of the at least innermost and outermost nested tubes and extending along the substantial length of each of the tubes...". The Examiner has consistently interpreted Applicant's claimed invention as an innermost tube with one or more array of orifices. Soichiro teaches "an elongated innermost tube (item 3, Fig.1,2) attached to a gas supply (5, Figure 1, page 6, last paragraph of translation) at one end and capped at the other... one or more arrays of orifices (items 13, 14, 15; Fig. 1,2) formed in each of the at least innermost (item 3, Fig.1,2) and outermost (items 2,1, Fig.1,2) nested tubes and extending along the substantial length (Figures 1,2) of each of the tubes". As such, Soichiro's innermost tube with one or more array of orifice is Soichiro's innermost tube (item 3, Fig.1,2) as stated prior.

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10. Applicant argues the scope of the term “connected”. The Examiner interprets “connected” as components that are in some way fixed together, either directly or indirectly, forming a larger aggregate.

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### Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311. The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner can not be reached please contact the examiner' supervisor, Gregory L. Mills, at (703) 308-1633.

*Rudy Zervigon*  
8/25/13